TEXAS Highways

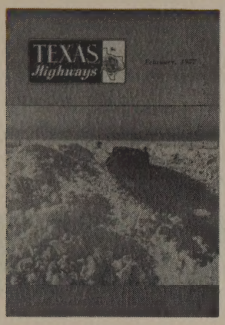
February, 1957

Do You Know Texas ?

Of the many trees native to Texas, the pecan was designated as state tree by the Thirty-sixth Legislature in 1919. Although Texas is the leading state in the total number of pecan trees, this was not the reason for its selection. Sentiment for the pecan tree is said to have developed because of a request by the first native-born Texas governor, James Stephen Hogg. Hogg asked that instead of flowers at his grave, a pecan tree be planted there.

Tourists entering Texas and expecting to find flat prairie and ranch land are amazed to find trees of any kind. But it's a fact that more than one-fifth, or 35 million acres of Texas are in forest. Besides the pecan tree, there are 144 other woody plants which reach tree size in Texas. Pecans are found in widely scattered parts of the state along streams, but most are located in Central Texas. The tree pictured is in Austin.

About the Cover . . .



A snow scene on the cover of a Texas magazine calls for an explanation in some areas of the state. It certainly can't be called a typical winter scene since snow is an uncommon occurrence in the largest part of the state. Residents of West and North Texas, and especially the highway maintenance men who must "dig out" to keep traffic moving, can vouch for that fact that it **does** snow in Texas. But about the time our cover picture was being made in one of the Panhandle districts, the orange trees were in bloom in the Lower Rio Grande Valley and highway maintenance men were watering roadside plantings. Some of these great contrasts in winter maintenance are told in a story on page 2.

Vol. IV

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TEXAS Highways

The purpose of this publication, "Texas Highways," is to furnish a medium for presenting practical ideas and information. Employees are invited and urged to submit suggestions and relate experiences which would benefit or be of interest to Highway employees. These conclusions and data are not necessarily endorsed by the Highway Department nor are they to be construed as instructions.

Photographic services are available and other assistance may be obtained, if desired, in preparing material for submission. All material and comments should be directed to the Information and Statistics Division, Austin 14, Texas.

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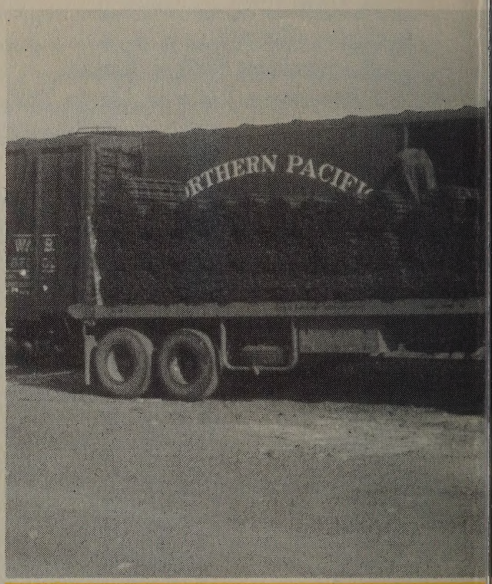
COMPILED AND EDITED
Information and Statistics Division

WINTER MAINTEN

Nothing illustrates the size and the climatic extremes of Texas as graphically as the vast differences in winter maintenance problems.

While some districts are hooking up snow plows and stocking up on snow fences, our southernmost district is carrying on such routine maintenance chores as watering roadside plantings, mowing grass, striping and patching highways, and applying seal coat. While maintenance men in the northern districts are plowing through snow drifts and battling icy roads to keep traffic moving, District 21 is coping with the problem of fruit vendors on highway rights of way -- a constant maintenance problem in this district throughout the fall and winter.

Although snows such as the one that covered northwest Texas last winter are not an every year occurrence, there is always ice and snow, and there is always wind to pile the snow up in drifts. Clearing starts as soon as there is enough snow for the equipment to operate and in times of emergency all necessary employees are on 24-hour call. Heavy snow removal equipment is transferred from one location to another within the district in an effort to keep all roads open; salt is sprinkled on icy grade separations, city streets, and hills, and it is probably about this time that maintenance men start thinking of asking for a transfer to South Texas.



In preparation for the winter snows, District 4 personnel have erected snow fence. Here, one of the men is in the process of unloading two carloads of these fences.

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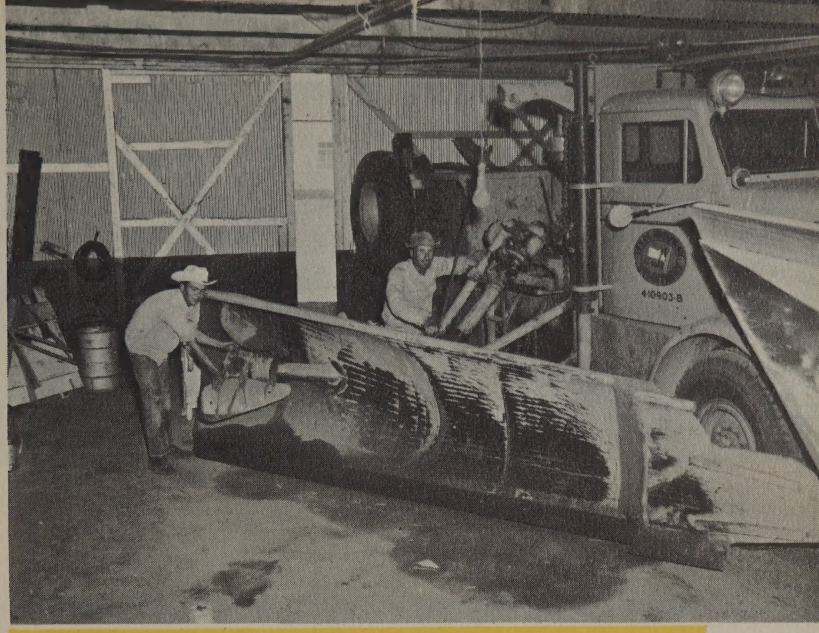
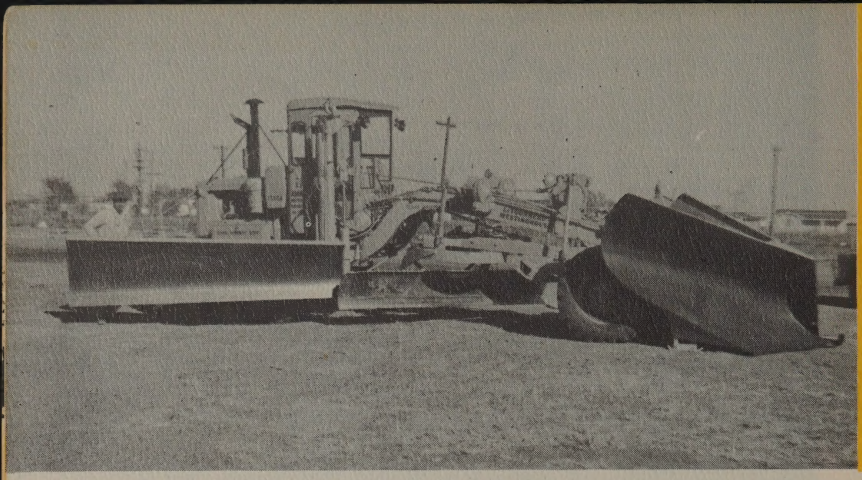
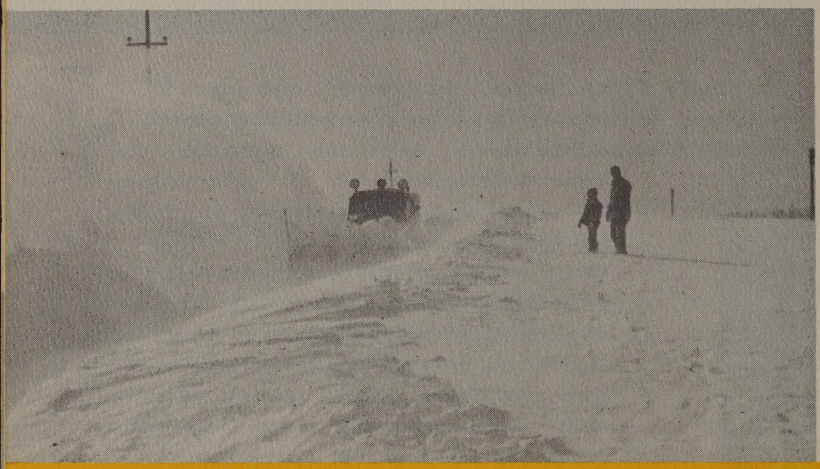


Charles N. Furr, Semi-skilled Laborer, and James W. McCrary, Skilled Laborer, snow plow operators, check the Roto Wing on their plow.

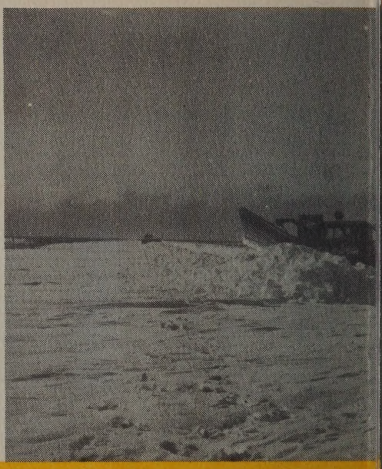
Last winter's snow storm was responsible for a lot of new equipment in the northern districts this fall. This is one of the two Snogos that District 5 added to its snow equipment.



Large snow plow and wing are mounted on motor grader for heavy snow removal. District 5 has five new plows like this. Since equipment is scattered over the district and must be routed to wherever it is needed most, some sections were without necessary equipment during the 1955 snow storm. Other districts in the snow area also got new equipment.



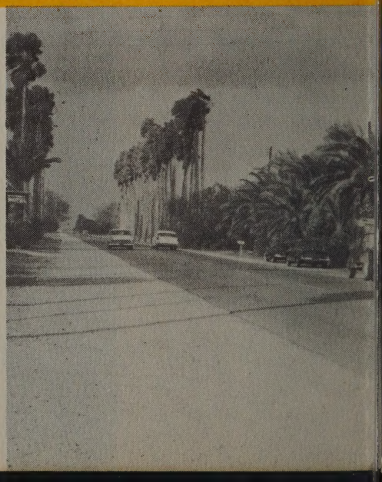
The wind helped to make the snow in District 4 worse by piling it up in drifts. A Snogo works its way through one of these drifts.



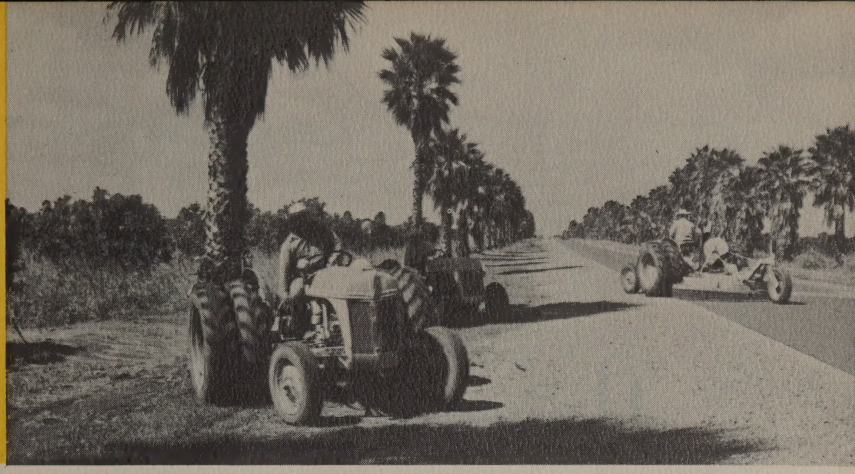
There must be a road ther operator find it?

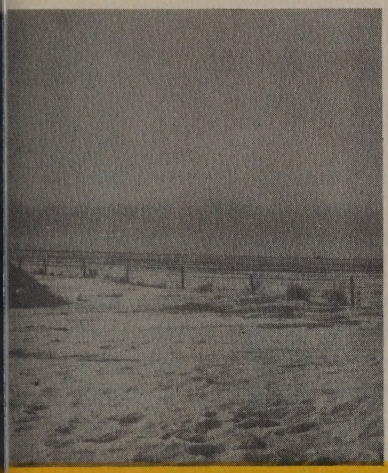
It isn't too cold for asphalt work in District 21. Here, a crew applies asphalt surfacing on F.M. 907.

Instead of removing snov keep fruit stands along high hazards.

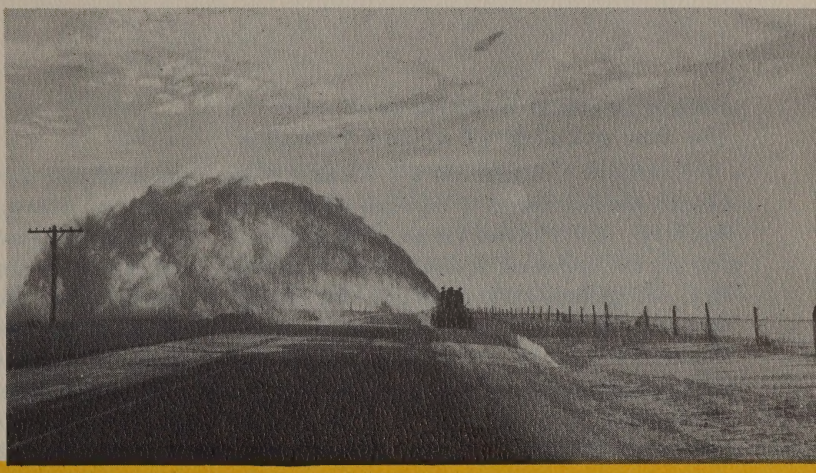


Typical winter maintenance job in the Rio Grande Valley is mowing grass on roadside on F. M. 492 in Hidalgo County.





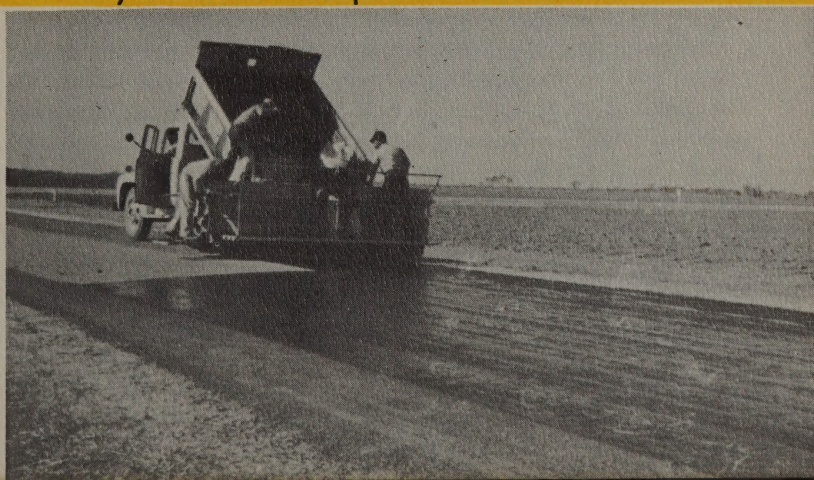
ut how did the snow plow



The Snogo does a thorough job of removing snow and makes a striking picture in the process.

District 21 personnel try to way from becoming traffic

Spreading aggregate for seal coat on F.M. 800, Cameron County--a routine winter job in the Pharr District.



National Engineers' Week

National Engineers' Week is celebrated annually by the National Society of Professional Engineers during the week of Washington's birthday. Engineers throughout the United States, District of Columbia, and Puerto Rico, in cooperation with industry, schools, and other engineering societies, bring to the public a recognition of the vital function of the engineering profession in the civilian and defense economy of the nation.

The National Society of Professional Engineers was formed in 1934, and its membership totaled 34,577 as of September 30, 1956. There are fourteen different classifications of engineering. The Texas Society of Professional Engineers was formed as a part of the National Society of Professional Engineers in 1936 and incorporated under the laws of Texas in 1937. At that time, two chapters comprised the entire State Society, Bexar Chapter and Travis Chapter. Today there are 23 chapters in Texas with a membership of 4,071, of which 276 are Highway Department Employees.

The National Society is organized on a three-level basis—local community, state, and national. At each level the organization is a self-governing unit in its dealing with problems concerning engineering practice and the public welfare in its area. At each of the three levels it has actively promoted effective state registration laws for professional engineers for the safeguarding of the public. It also maintains continuing liaison with legislators and government agencies to protect the public welfare by setting rigid standards for professional competence and ethical practices.

Projects for 1957 for the State Chapter, Texas Society of Professional Engineers include efforts to secure adequate salaries for state-employed engineers; counseling of high school students; solving of Texas' chronic water problem; cooperating with State Board of Registration for Professional Engineers to revise Senate Bill No. 74, Acts Regular Session, 45th Texas Legislature (more commonly known as the "Engineering Registration Act"), and continuing its program to assure public safety in seeing that engineering is practiced only by qualified engineers.

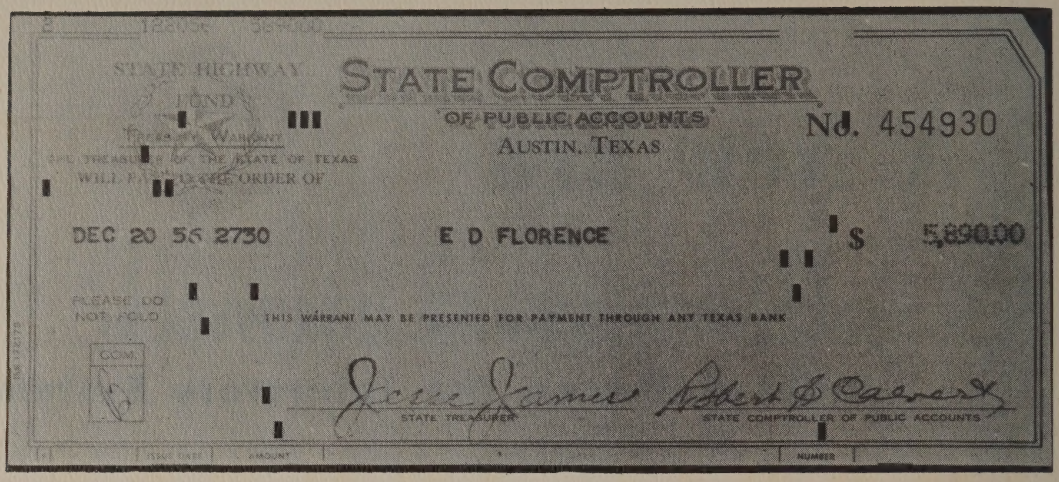
A New Era

State Purchases First Piece of Right of Way on the Interstate System

The first piece of highway right of way ever bought by the state was purchased on December 20, marking a new era in highway building in Texas.

A check for $5,890 went to E. D. Florence for a tract in Dallas County to close the deal. Located on U.S. 67

Frank Cawthon hands this $5,890 check to E. D. Florence for the first piece of right of way bought by the State.



The "famous first," close up.

about five miles east of the junction of U. S. 67 and U. S. 80, this tract is one of about 60 needed on this section of highway for widening the right of way and building frontage roads to bring U. S. 67 up to full expressway standards from Dallas toward Texarkana. Some tracts have previously been secured by local governmental agencies.

U. S. 67 here is already four lane divided, but since it is on the Interstate System it must meet the new Interstate standards which call for completely controlled access.

State Highway Engineer D. C. Greer emphasized that this right-of-way purchase was made possible only by the fact that the Federal Government is putting up 90 per cent of the money and the state 10 per cent on the Interstate System. The Highway Commission changed its right-of-way policy on this system following the passage of the Federal Aid Highway Act of 1956 which set up the 90-10 federal-state matching ratio, he said, but there has been no change of policy, and the state is not presently going into the right-of-way business on the other highways of the system.

Greer commended both the Bureau of Public Roads and the Highway Department's right-of-way personnel for the speed with which this first purchase was completed.

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It Might Cause Heart Failure, But . . .

According to the American Public Works Association, a new invention makes it possible for warning words like "danger" to be transmitted from the highway's surface into a passing vehicle. Special panels are set into the surface of the pavement similar to sound tracks which have an undulating upper surface conforming to the shape of a predetermined sound wave. The undulations lying above the road surface cause an audible sound to be heard within the car when it crosses the panel. The body of the vehicle acts as a sound box to give an understandable warning to the driver.

SHORT COURSE

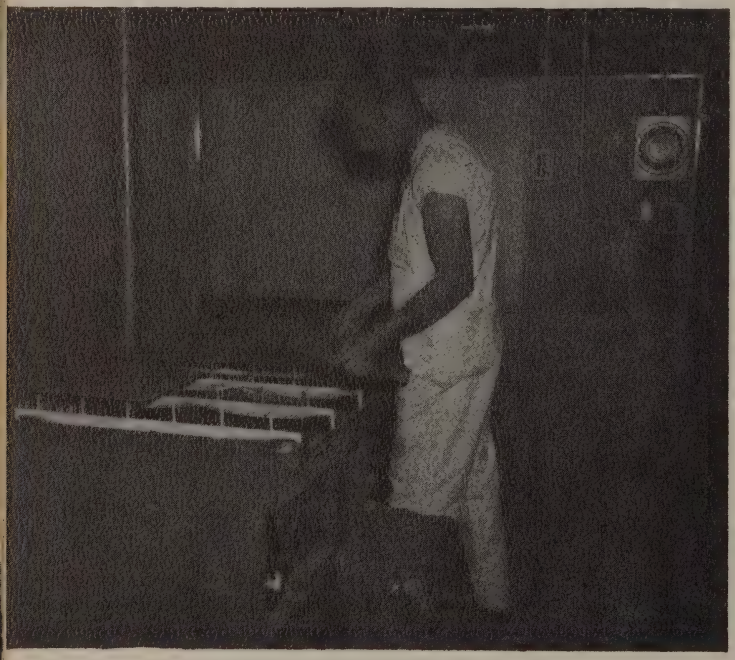
The Thirty-first Annual Short Course is scheduled for February 19 through 21 at A & M College. The District Engineer, Division Head, Engineer-Manager meeting will be held February 18 at the Memorial Center.

On February 19, the first half day will be general assembly and general topics. From there on, the meeting will be devoted to technical and committee sessions, divided among specific functions as it was last year.

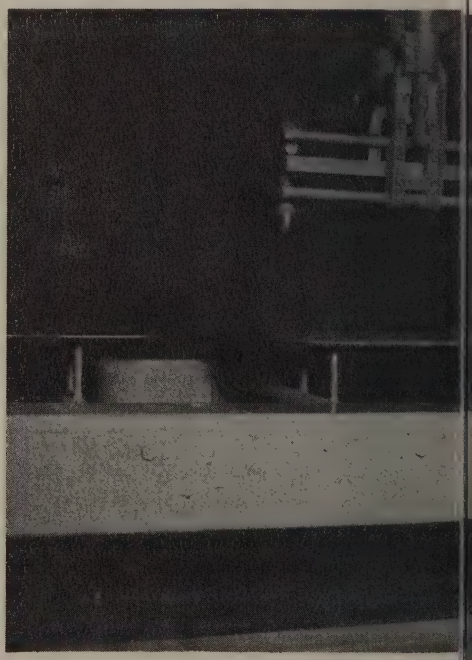
A Short Course Bulletin will again be published this year, containing papers of speakers. Arrangements have been made for C. J. Keese, Associate Professor in the Civil Engineering Department at A & M, to collect the papers and forward them to Information and Statistics Division. Manuscripts should be originals, preferably single spaced, and in condition to be photographed.

AUTOMATION Strikes A

The day and age of automation is here to stay. In keeping with its policy to continually be on the lookout for faster and more economical ways to do a more efficient job the Texas Highway Department has added another first in the field of automation. The latest inovation is an automatic paint sprayer for painting sign blanks. Recently two machines were installed in Districts 21 in Pharr and 14 in Austin. Both districts report they are well pleased with the operation of their sprayers. Texas Highways was given a "Cook's Tour" of the District 14 ultramodern, explosion-proof sign shop and gained a first hand account of the performance of

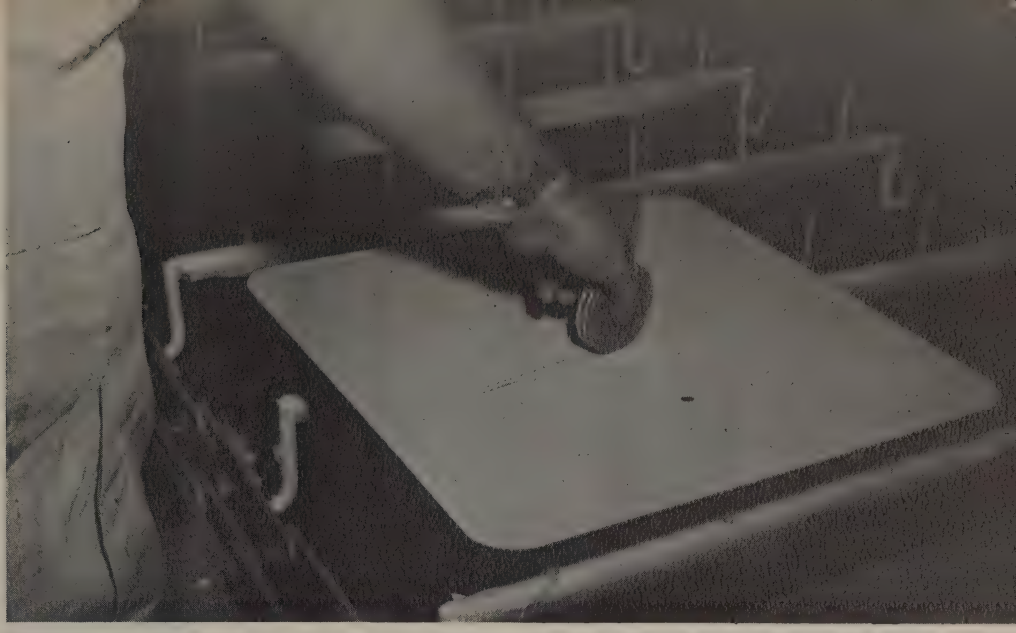


Coy C. (Doc) Clifton, Skilled Laborer, places sign blanks on conveyor belt.

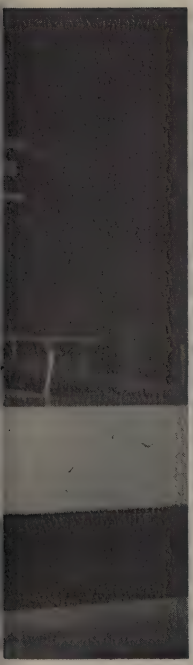


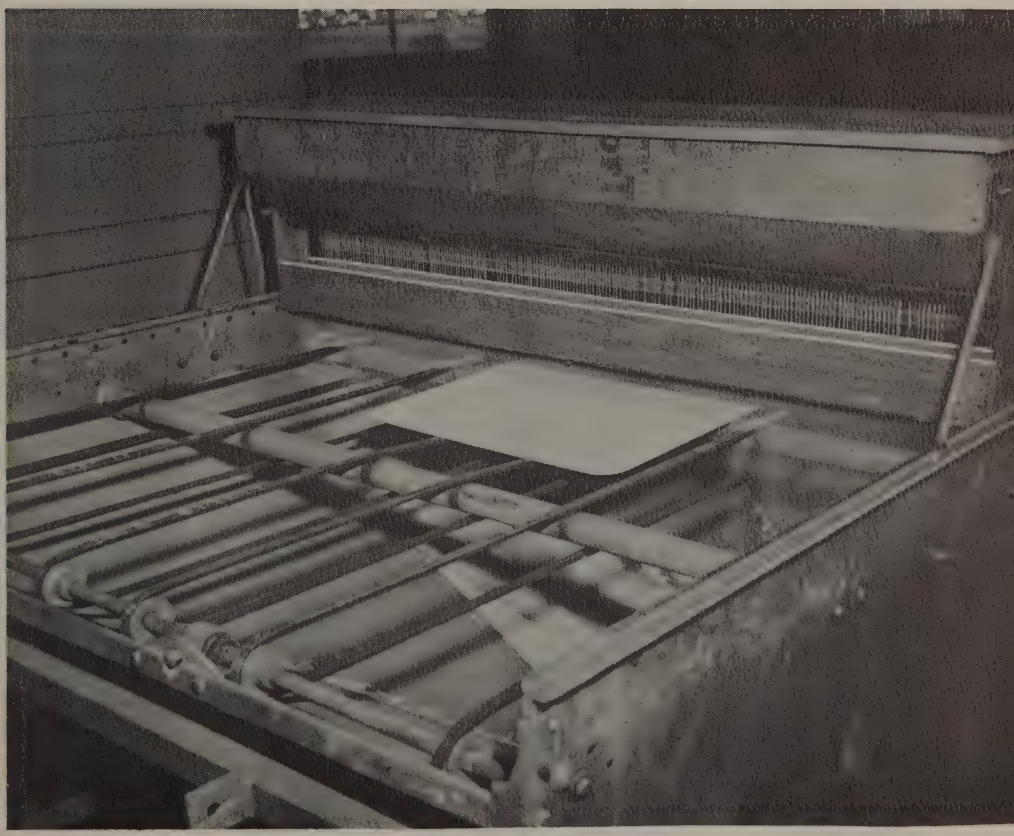
Signs on the conveyor belt pass under the sprayer heads.

gain



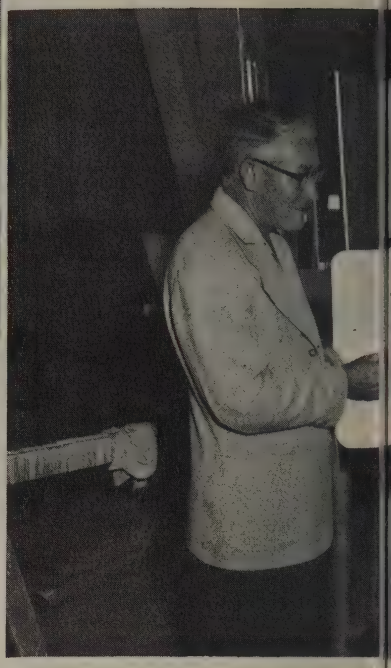
This wet paint thickness gauge was made by A. M. Quist in the Camp Hubbard Shops.





A motor-driven conveyor belt carries freshly painted signs through the glass-beading machine.

Margarito P. Corpus, Semi-skilled Laborer, unloads freshly painted signs from painting machine and places them on drying racks.



Floyd G. Self, Sign Supervisor District Engineer, inspect a sign

their automatic sign blank sprayer.

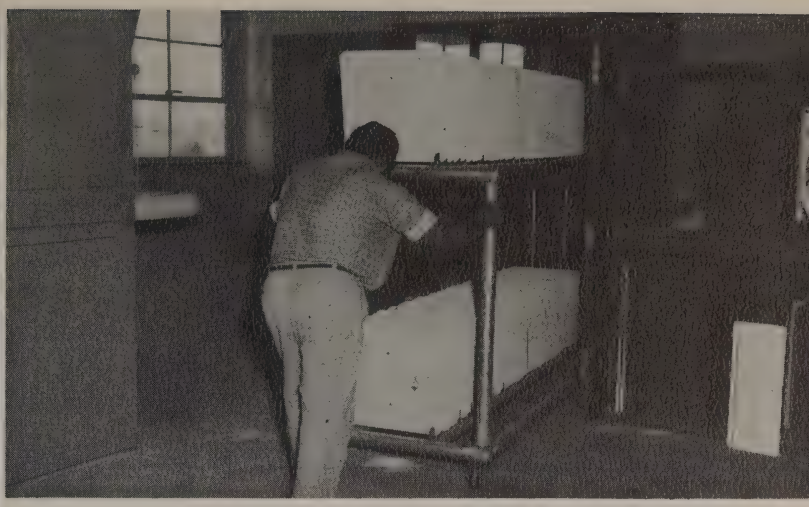
Essentially the paint spray machine consists of a reciprocating mechanism equipped with two paint spray guns, a conveyor for carrying the sign blanks through the booth, and a booth equipped with a water screen, water tank, and exhaust fan for collecting and rendering harmless excess paint and paint fumes.

Blanks are placed side by side, face up, on a conveyor belt which carries them through the housing for the paint spray bars. There are two spray bars which apply paint on the forward and reverse strokes. The stroke can be adjusted to spray only while passing over the sign blanks, thus holding any waste of paint to a minimum. A powerful exhaust system pulls the fumes and any excessive paint spray from the housing and prevents its escape into the shop. A small reservoir of slush water diluted with paint thinner is held beneath the spray bars to catch any paint which might possibly miss the sign blanks.

The leading spray bar, along with the second spray bar, applies standard WP3 (white) or YP1 (yellow) paint as the sign continues its journey on the conveyor belt. The blanks are stacked edgewise on a specially prepared rack to conserve space and insure drying uniformity. When sufficiently dry they are again placed on the conveyor

William H. Whitted, Semi-skilled Laborer, retouches a stenciled sign.

and J. M. Owens, Assistant



Here, Corpus moves a drying rack loaded with signs into a drying room.

belt and given the second coat. This process is followed until each side has received two coats, two mills thick. A third or binder coat, WP8 or YP9, is applied to the reading surface of the blanks and while the binder coat is still wet they are run through the beader, where beads are applied for reflectivity. They are again stacked in the special rack for drying, awaiting only the message they will receive to carry to the traveling public.

Electric outlets and light switches were designed to prevent electric sparks when operated.

Several advantages of the automatic paint spray machine were pointed out by Floyd Self, Sign Supervisor in charge of the shop. A more uniform coat of paint can be applied in a much shorter interval of time and it is a space saver as it requires only a fraction of the area needed to perform this operation under normal conditions in the conventional manner. The prime factor, however, is the economic savings this machine offers over the old method of painting sign blanks. Approximately one hundred 30 by 30 sign blanks can be given one coat of paint in one and one-half hours, while the 18 by 18 blanks can be painted at the rate of 200 per hour. The coating of these blanks can be done in a much more efficient manner and working conditions are much healthier due to the machine's ability to minimize polluting the air with paint spray. No masks are needed.

Life-saving Awards Go to THD Employees

Identical twin brothers who are employed by the Highway Department in District 21 have received Certificate of Merit awards from the American Red Cross for saving the life of a shooting-accident victim last July.

Presentation of the awards, highest honor given by the American Red Cross, was made at a special ceremony November 16, 1956, in Dallas.

Hubert and Milton Bonham, Semi-skilled Laborers, both of Pharr, earned their awards in a life-saving

Hubert and Milton Bonham, Semi-skilled Laborers in District 21, received Red Cross Certificate of Merit for saving the life of a shooting accident victim last July.

action which took place July 21, 1956. They came to the heroic rescue of Homer Holland, also of Pharr, who accidentally severed the main artery in his foot. The victim was cleaning a shotgun on his back porch at the time of the accident.

The Bonham twins applied a tourniquet to the injured area and kept Holland quiet until an ambulance delivered him to the Weslaco Hospital. Both men, age 27, are first-aid instructors for the Hidalgo County Red Cross Chapter. They have been with the Department since March of 1955. Tracey Haliburton, their immediate supervisor in the Highway Department, is first-aid chairman of the same chapter.

Holland's foot had to be amputated, but his life was saved.

According to Haliburton, these two awards bring to 102 the number of residents of the State of Texas who have received this honored recognition. Awards for saving life were established by the Red Cross in 1913.

These two awards, the 628 and 629 given in the sixteen-state Midwestern Red Cross Area in 43 years, were recommended by the Hidalgo County Red Cross Chapter. The Red Cross National Awards Committee at Washington, D. C., approved the awards after considering statements from eyewitnesses and physicians on the merit of the life-saving action.

To qualify for a Certificate of Merit, a person must have been trained in Red Cross first aid or water safety, and must have used this training in "saving or attempting to save the life of another in an act adjudged meritorious."

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HIGHWAY GEOLOGISTS SPEAK

Four Highway Department employees took part in the sixtieth annual meeting of the Texas Academy of Science held in Brownwood December 13-15.

Hubert Henry, Senior Designing Engineer for the Road Design Division covered the development of the geology program in the Department from its beginning to its present status, and outlined procedures used in working out engineering geology problems.

Frank Rife, Staff Geologist in D-8, presented a specific problem of highway engineering and the application of geology used in solving it.

James Kelley, Senior Laboratory Engineer for the Waco District presented the methods and procedures used by the Districts, which have staff geologists.

Robert McKinney, Staff Geologist for the Waco District, developed an actual project involving engineering geology.

USING BORASCU *FOR WEED AND GRASS CONTROL*

Frank W. Cawthon, District Engineer
District 18

In an effort to find some effective means of eliminating expensive and time-consuming hand labor in cutting of grass and weeds around sign posts, guard fence posts, culvert headwalls, and other obstructions within the right of way of our highways and farm roads we asked for and secured D-18 concurrence in June 1954 for experimental use of Borascu.

Borascu is a product of the Pacific Coast Borax Company and is a sodium borate ore, of which borax is the refined product. It is nonpoisonous to animals but is not selective in action and affects all types of vegetation. For this reason care should be taken to avoid its contact with lawn, trees, shrubs, and other growing plants you do not wish to injure or destroy. It is applied dry, by hand from a bucket, or with the use of a fertilizer spreader. It should be applied during the late fall and winter months. It can be handled with the highest degree of safety since it is

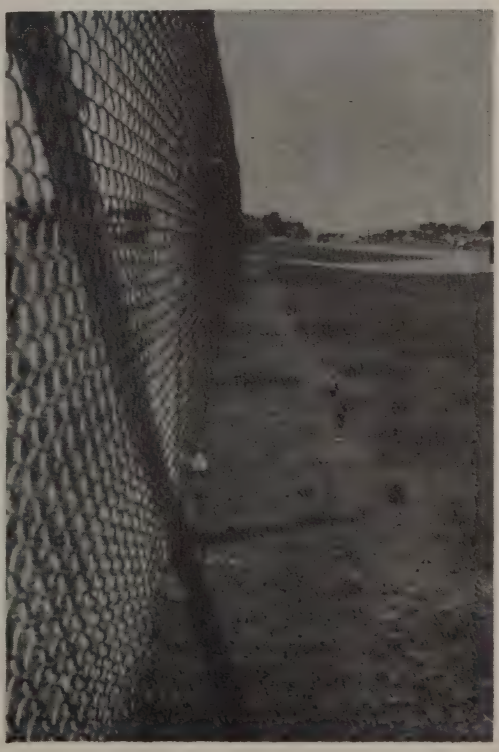
Borascu was placed in fall of 1954, and pictures were taken June 2, 1955 of these posts treated with two pounds of Borascu.

This overgrown area is an untreated section south of Ten Mile Creek.

Two pounds of Borascu were placed around each post in fall of 1954. Pictures were made in May of 1955.

nontoxic, nonflammable and noncorrosive to ferrous metals. The Pacific Coast Borax Company recommends application of twelve pounds per 100 square feet for perennial vegetation such as Bermuda grass and Johnson grass and seven to eight pounds per 100 square feet for annual weeds and grasses.

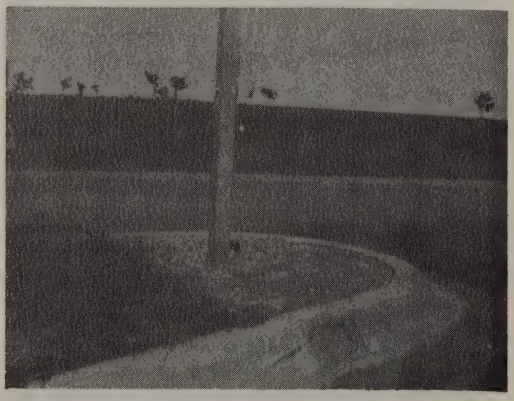
In the fall of 1954 we purchased nine tons of concentrated Borascu in 50-pound bags for $129.68 per ton, F.O.B. our warehouse in Dallas. We used it principally around sign posts and guard fence posts but some was used around warehouse fences, culvert headwalls, and timber bridge bulkheads and wingwalls. These



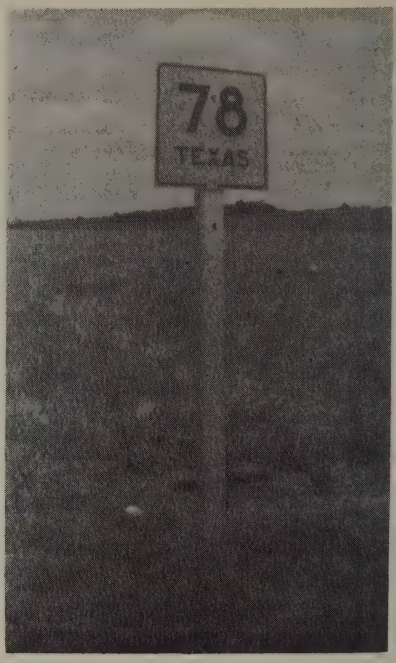
This area along fence at Dallas S/S Maintenance Warehouse was treated with Borascu at a rate of twelve pounds per 100 square feet. Borascu was placed in the fall of 1954. Pictures were made in May of 1955.

The area around this timber wingwall is completely free of vegetation. Material was placed in fall of 1954. Pictures were made in June of 1955.

Pictured is a concrete culvert and headwall following use of two pounds of Borascu placed last fall.



On this island, two pounds of Borascu were used last fall. There was complete kill.



Borascu was used last fall around this sign. Two pounds were used.

pictures of some of the treated areas were taken in May and June of 1955 and show rather well the effectiveness of the treatment. The materials, labor, and equipment required made the treatment cost 3 cents per square foot. Practically all grass and weed cutting can be done with power mowers when growth around obstructions is controlled with the Borascu. Vegetation is cut from the area to be treated and this vegetation and a small amount of dirt are scraped away. The Borascu is then distributed over the area and covered with the dirt and cut grass. The winter and spring rains then dissolve the Borascu and the treated area is sterilized.

Inasmuch as the results of the initial experiment were satisfactory, we ordered and used 26 tons of concentrated Borascu in the fall of 1955. The price of that shipment was $96.02 per ton F.O.B. our Warehouse in Dallas. This fall we have secured 38 tons at a price of $98.18 a ton.

Guardians of Safety

Trouble occurring on any of the more than 55,000 miles of Texas highways can be an inconvenience and often a hazard to the millions of travelers in the state.

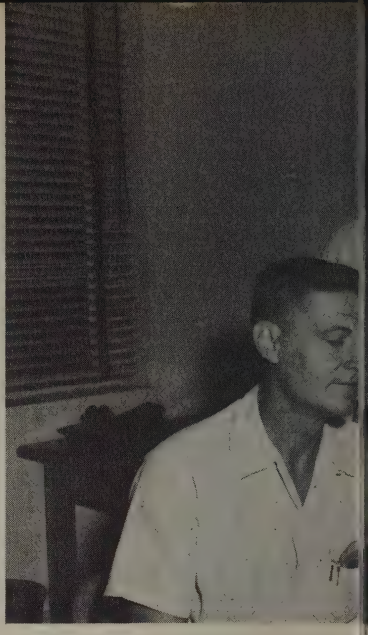
To combat this problem, the Department a few years ago worked out the method now used throughout the state. Reporters in each of the Districts are responsible for seeing that anything affecting travel or creating hazardous driving conditions in their District is teletyped or called in to the Information and Statistics Division in Austin. The information is then compiled and sent to the Districts, to the wire services, newspapers, and various agencies providing this information to the traveling public.

Ordinarily we think of snow storms, icy highways, or floods as slowing down or stopping travel, but other things can be just as important—things such as oil-well fires, uncapped gas wells, a butane truck turning over, or vehicles hitting and damaging bridges. These accidents can close highways to travel or make traveling dangerous also.

Listed are the men responsible for reporting road information in each District.

DISTRICT	REPORTER	ALTERNATE
1	C. L. Walker	James Jackson
2	Joe M. Bingham	James W. Tobey
3	L. E. Morris	L. B. Dean
4	James M. Harris	Will A. Riney
5	R. W. Tucker	Joel D. Willson
6	C. W. Batchelor	B. N. Peeples
7	R. N. Jennings	Hollis Keeton
8	Cecil A. Conklin	George M. Williams
9	C. D. Handley Jr.	J. H. Aiken
10	I. H. Crutcher Jr.	F. G. Rankin
11	James M. York	H. H. Melton
12	William L. Werneburg	James H. Doss
13	Zay Johnson	Earl Wyatt
14	Joe A. Russell	J. L. Wilder
15	B. E. Levegue	Herman Seele
16	E. M. Ruth	Herman Scheeman Jr.
17	O. L. Crain	J. O. Sloan
18	Grover Green	William B. Purcell
19	B. L. Frank	Roy Johnston
20	Milton Hayes	J. P. Fuller
21	Tracey Haliburton	Clyde Salter
22	E. L. Sanders Jr.	C. N. Parsons
23	E. M. Pritchard	William T. Moore
24	L. B. Harrison	Max W. Moore
25	Palmer Massey	R. L. (Bob) Nabers

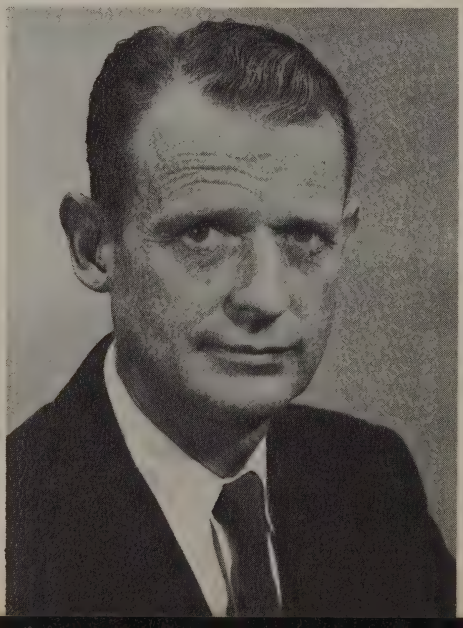
Sunlight and shade dapple the walls of the District 4 Office Building in Amarillo.



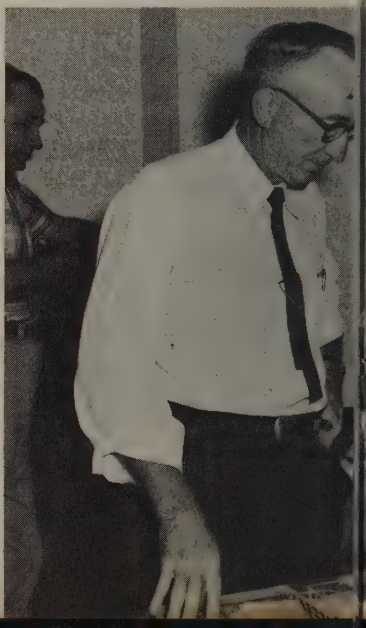
John G. Dewald, Senior
Donald H. Brummer, Senior

THE DISTRICTS PASS IN REVIEW DIS

Charles W. Smith became District Engineer last October when James Guy Lott retired. Smith has been with the Department 25 years, all of his service being in the Panhandle area of the State.



J. L. Payne, Chief Distri
Senior Accountant, check
estimate. Ben Lednicky, S
the background.



esident Engineer, Amarillo, and
spector, check a final estimate.

TRICT 4

Accountant, and A. K. Dixon,
supporting paper for the yearly
ior Landscape Adviser, stands in

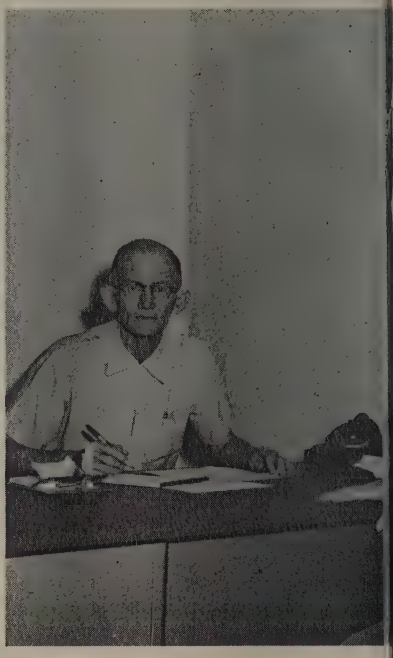
Although the seventeen Panhandle counties of District 4 sometimes seem far from the Central Texas scene, they are historically closely bound to both Austin and San Antonio. After the Texas Revolution in 1836, the Panhandle area became part of the vast Bexar County, which was not partitioned until 1860. The late 1870's saw the beginning of the enormous ranches which contributed many of the famous names in the Texas cattle industry — Charles Goodnight, John Adair, Thomas S. Bugbee, George W. Littlefield, and the foreign-owned Matador Land and Cattle Company, Ltd.

Although traditionally cattle country, the Panhandle territory has diversified into many industrial activities. Petroleum refining, meat packing, machinery manufacturing are a few of the growing enterprises that have been added to the older economic staples of cattle and grain raising.

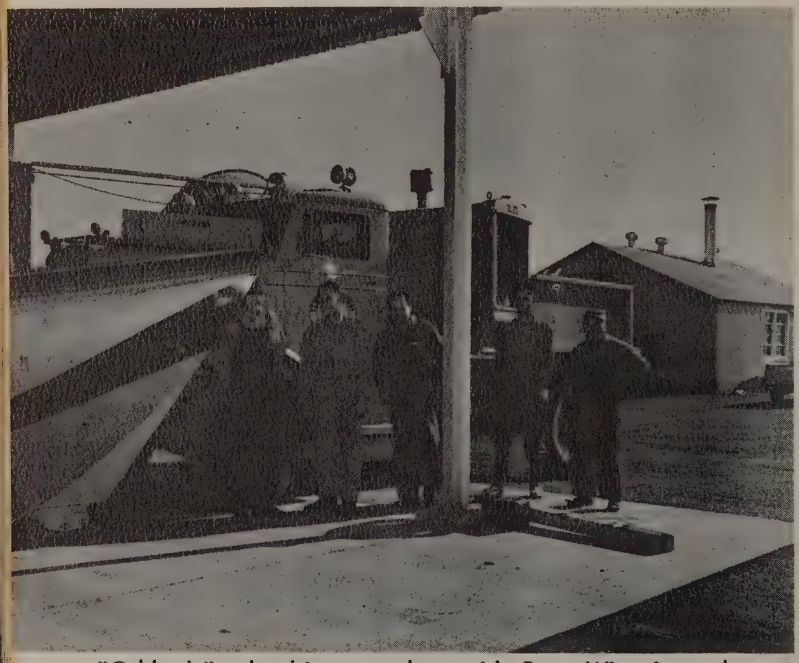
Amarillo, headquarters for District 4, is the commercial capital of the north panhandle plains. It is the center of one of the greatest crossroads of transcontinental and interregional highways, railways, and airlines in the western states. U.S. 66, part of the interstate system, will add to the capacity of the highway system in this area and its essential part as the Texas link between New Mexico and Oklahoma.

In addition to the scheduled interstate construction, District 4 has its regular responsibility of 2,540 miles to maintain. There are 348 employees who help with this task, and this District more than any other, has the additional roadway problems caused by the severe winter weather in this area.

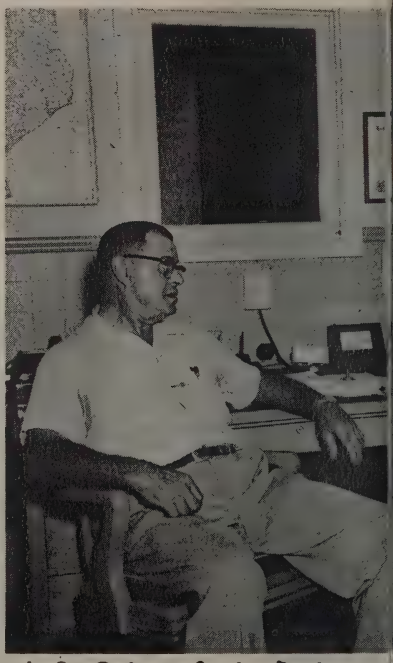
Gathered for a consultation are Kalman J. Nagy, Engineering Assistant; Ronnie W. Golladay, Rodman; Edmond A. Timmons, Senior Engineering Assistant; and Pete Styner, Senior Designing Engineer.



Byron Reese, Expressway Engi- Senior Designing Engineer, dis-

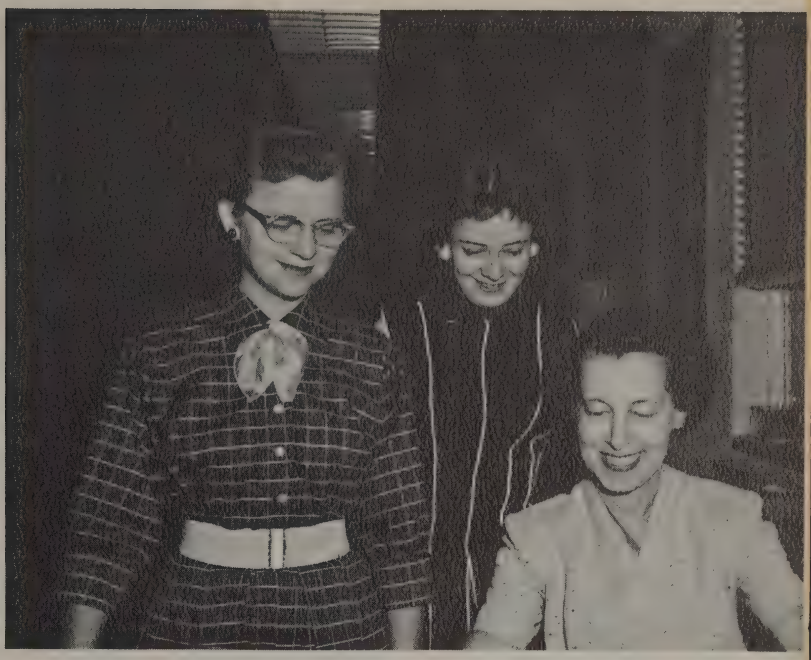


"Oshkosh", the big snowplow with Roto Wing is ready for the heavy Panhandle snows. The crew of Skilled Laborers standing by are Cecil F. Fonti, Billy J. Mooney, Clayton N. Porter, Clarence Bashford, H. L. Cantrell.



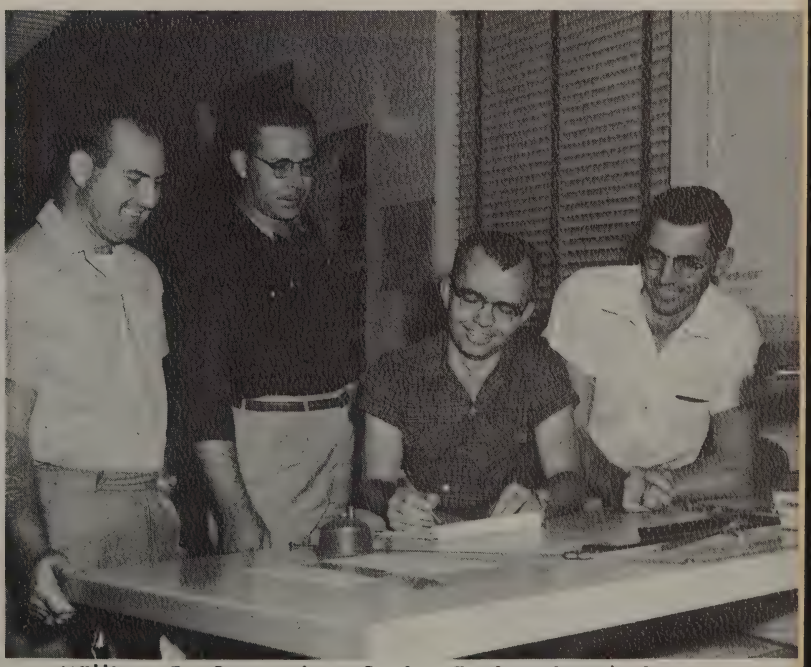
J. S. Gaines, Senior Equipment Senior Shop Foreman, discuss repair.

neer, and R. G. Schlinkman, cuss expressway problems.

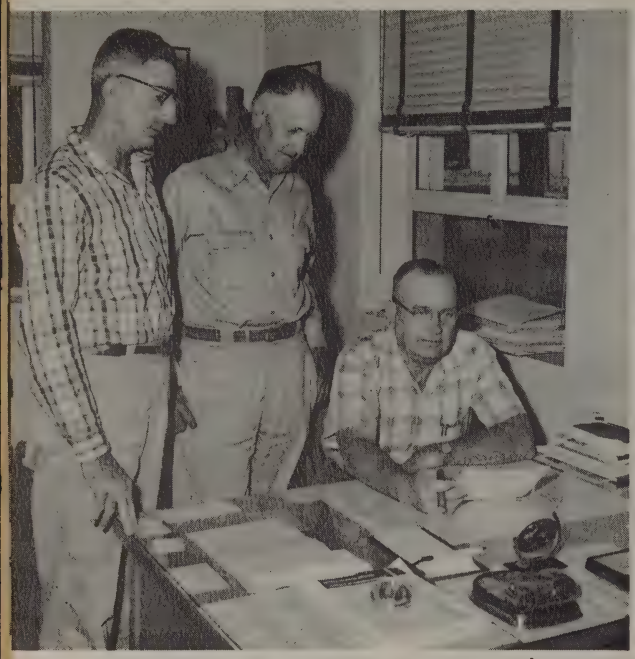


Checking the district ledger for county stock balance are Billie T. Watson, District Office Clerk, Glenna M. Colley, Junior Clerk (Resigned); and Eunice B. Best, District Bookkeeper.

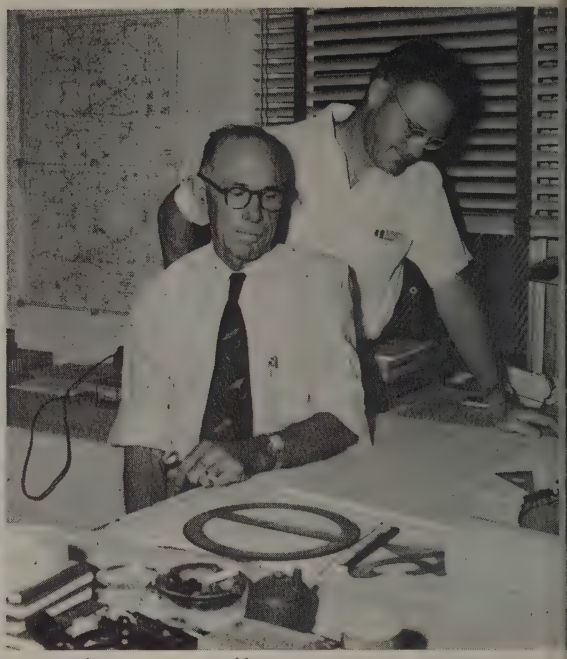
Supervisor, and Lige Stephens, equipment maintenance and



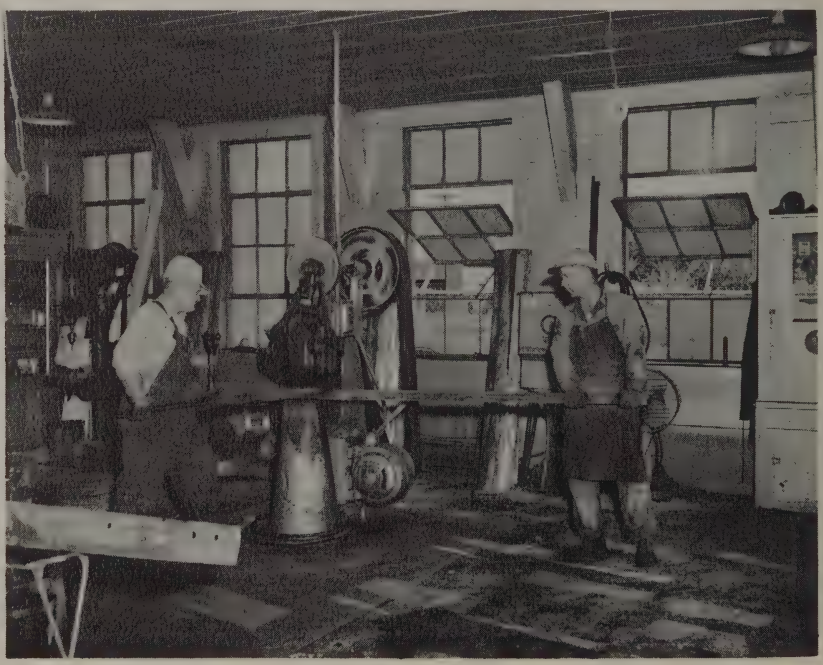
William E. Bryan Jr., Senior Engineering Assistant; Richard C. Crandal, Laboratory Engineer; Jack V. Light, Designing Engineer; and Lyndol B. Carter, Designing Engineer, work on a layout of an expressway intersection.



R. C. Liles, Construction Superintendent; Reuben Bewley, Senior Maintenance Foreman, and J. M. Harris, District Maintenance Engineer, review a special job-program estimate.



Hughie D. Trussell, Senior Designing Engineer, and Donald H. Rose, Senior Designing Engineer, work on drainage system for the Hobart Street Underpass at Pampa.



Clyde D. Friou, Skilled Laborer; and Euel P. Smith, Semi-skilled Laborer, use the blacksmith shop's electric hammer to work on a forge-heated maintenance blade.

Elizabeth Walker, Junior Clerk, and Carole Baker, District Office Clerk, discuss an overload permit.

Mildred S. Starr, Senior Secretary to the District Engineer, types a letter to the Austin office.

Robert D. McCabe, Warehouseman; Harold D. Steinle, Assistant Warehouseman; and H. K. Ammons, Senior Warehouseman, demonstrate the step-saving efficiency of their new shop-built freight elevator. The elevator is used in the new two story warehouse.

Skilled Laborers William L. Savelle and Tommie L. Duvak demonstrate the new locker room wash stand.

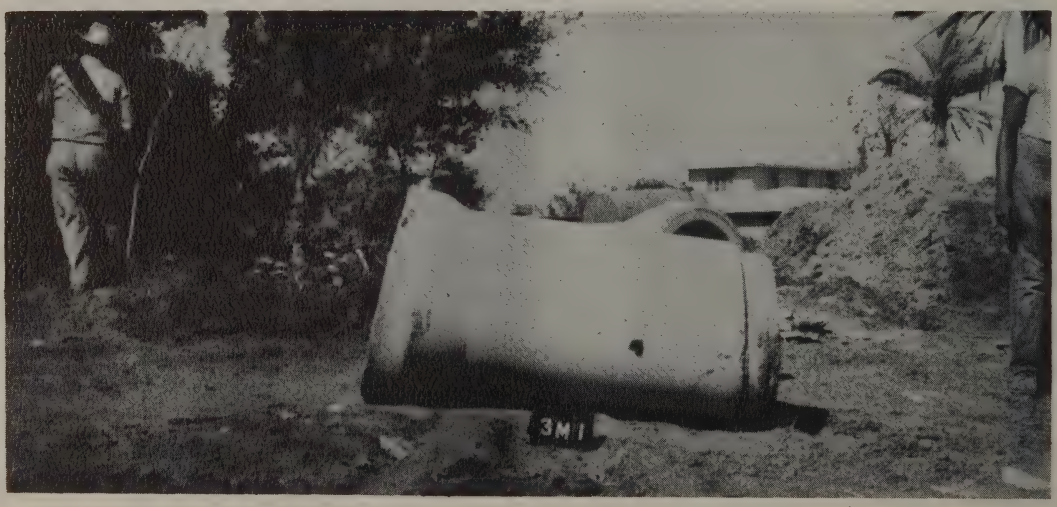
angle joints

FOR RUBBER GASKET CONCRETE PIPE

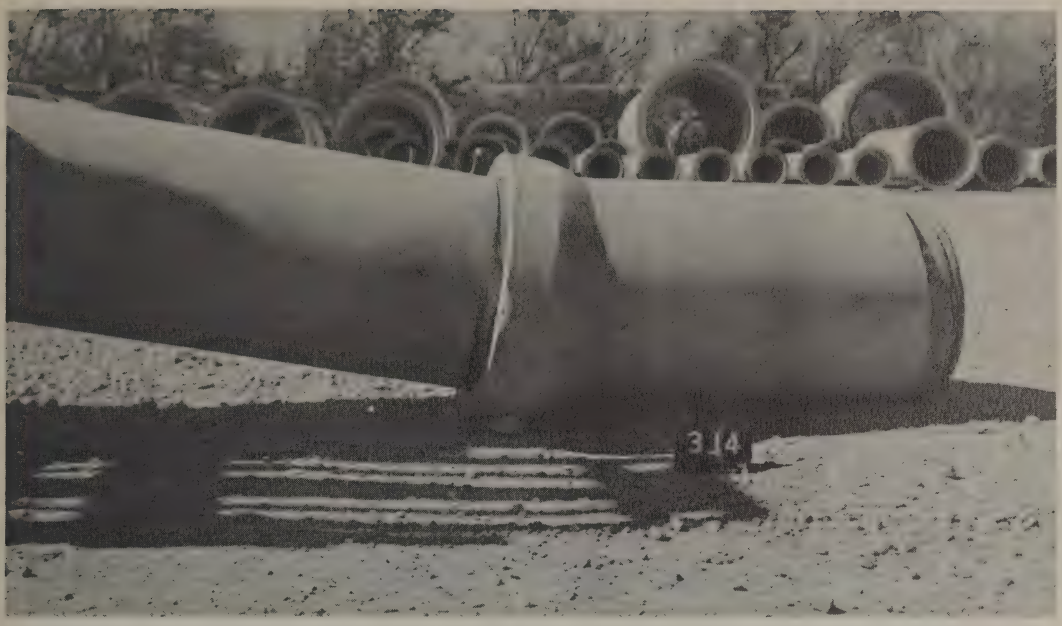
June T. Martin, District Construction Engineer
and
S. T. Crosby, Senior Resident Engineer
District 21

Almost every contract in the irrigated section of District 21 provides for the installation of concrete pipe siphons crossing the highway. All of these siphons are of standard reinforced concrete pipe and, until recently, the joints were banded with cement mortar. The use of round rubber gasket joints is now prevalent (see article in Texas Highways, July 1955) and has practically done away with leakage due to shrinkage cracks at mortar joints.

The horizontal section of these siphons is installed from roadway ditch line to roadway ditch line with approximately four-feet of cover at the center line of the highway. At each ditch line the siphon breaks up on a 3 to 1 slope and intersects the flow line of the canal. At this angle point it is necessary to cut the ends of the pipes to fit, thereby necessitating a mortar joint. This joint invariably cracks and causes leakage, even though the round rubber gasket joint is used in the balance of the siphon. One of the valley manufacturers of concrete pipe was requested to cast an angle joint that could be used with a round rubber gasket. This manufacturer came up

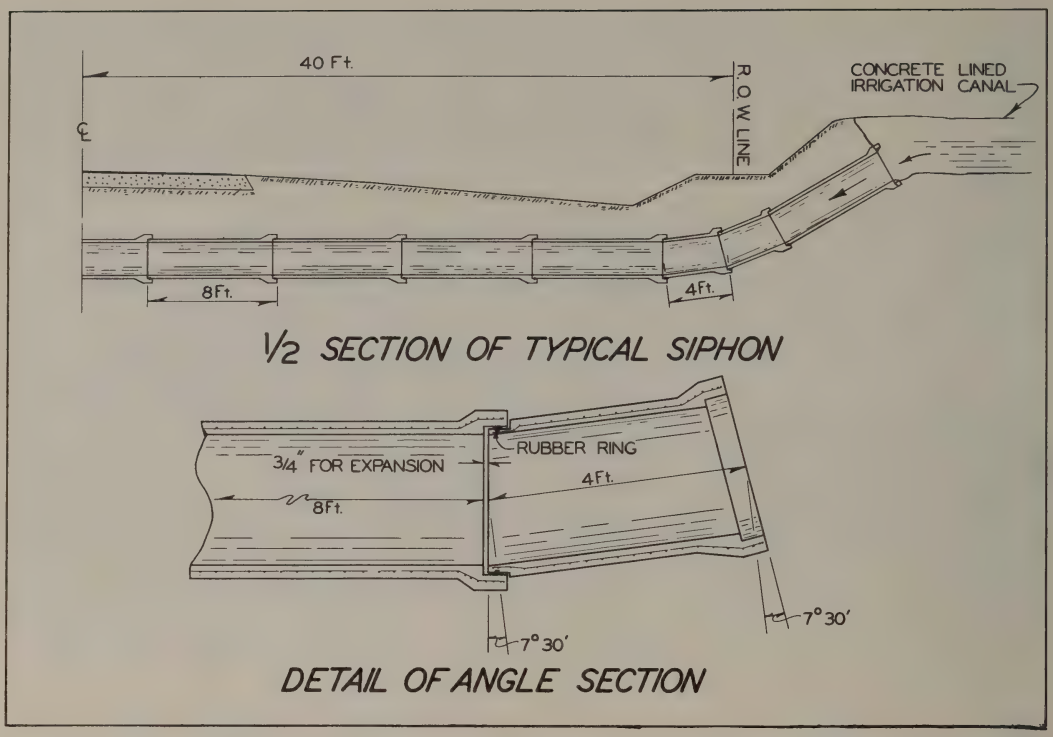


Section of pipe showing the built-in angle at each end.



One four foot angle section showing the connection with standard eight foot section and forming a seven and one half degree angle.

Sections of pipe layed out on the ground to demonstrate the "angle joints".



Actual installation of concrete pipe siphon using two four-foot sections with the angle joints.

with what we believe is the answer to our trouble.

This company manufactures a spun pressure pipe and, by setting the mandrel in each end of a section of pipe at a 7 1/2-degree angle to a line normal to the center line of the pipe, a joint was formed that could be used with a round rubber gasket and turn a 7 1/2-degree angle at each end of each section. These sections are made in four-foot lengths and two sections used together form a 30-degree angle and still permit the use of a round rubber gasket in every joint. This accomplishes the desired invert and, at the same time, does away with the troublesome mortar joint at the angle point.

To date only one siphon using these angle joints has been installed. This installation was made on F. M. 88, Project R 698-3-4 in Hidalgo County and is being watched for any bugs that might develop. Should none develop, we believe that all siphons on future projects should be installed with these angle-type joints.

CERTIFICATE OF MERIT

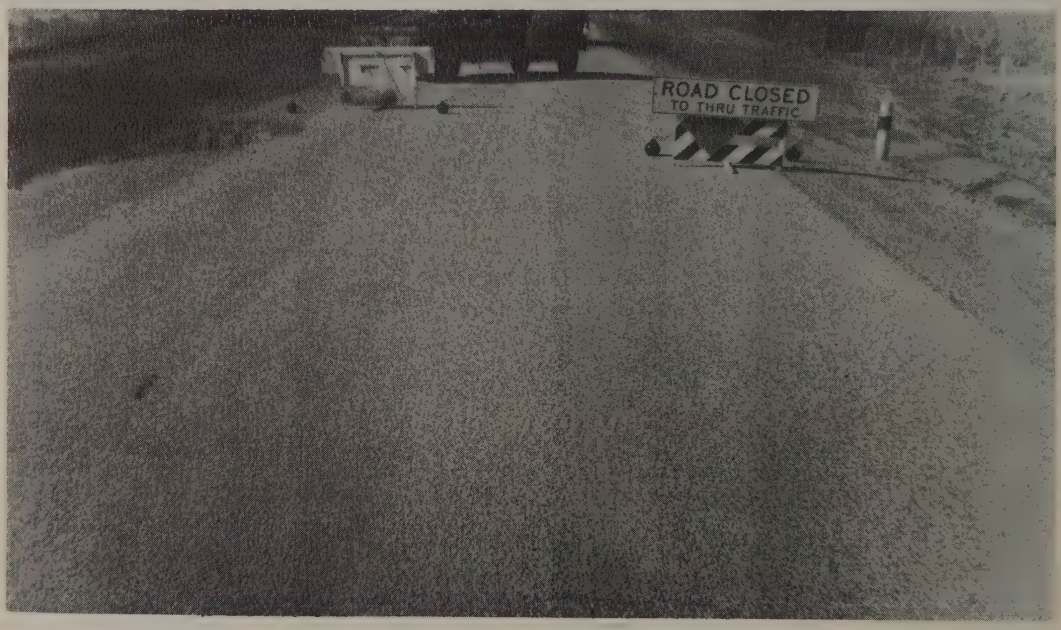
Above, District Engineer F.M. Davis accepts one of two awards made in December by the Beautify San Antonio Association. These awards are made monthly to organizations or business firms which have done an outstanding job of keeping their outside premises and grounds clean, and have carried on a substantial beautification program. Davis (second from the left) holds the award presented to the District Headquarters of District 15 by L.K. Patterson, far right, as Mrs. Lewis Turner offers congratulations. To the right of Davis is Jack Beretta, president of the First National Bank, and recipient of the other December award.

Rain Did This

J. A. Snell, District Engineer
District 7

A recent heavy rain in Kimble County did this damage to newly completed F. M. 2351.

The rain washed out a portion of the fill around a culvert and moved the pipe several feet. However, a sufficient amount of fill, base, and pavement was left to provide an arch, which was sufficiently strong to carry several vehicles over it before traffic was stopped after the damage was discovered.



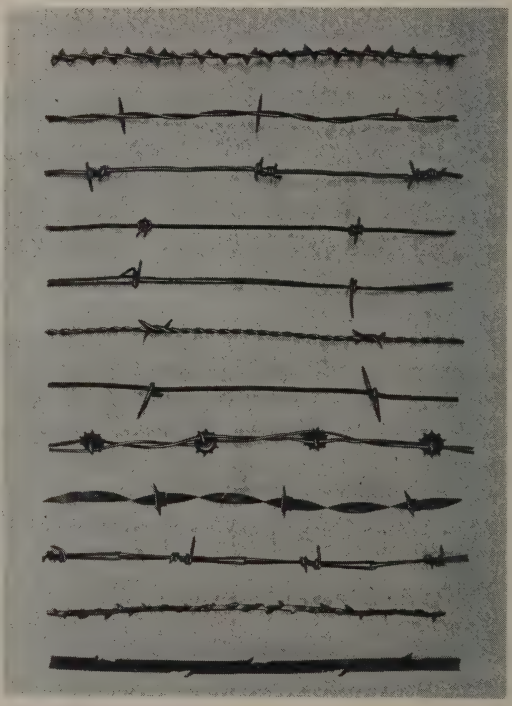
F.M. 2351, Kimble County. Arch over washed out pipe being broken.

Pipe washed to point marked by foot of workman.

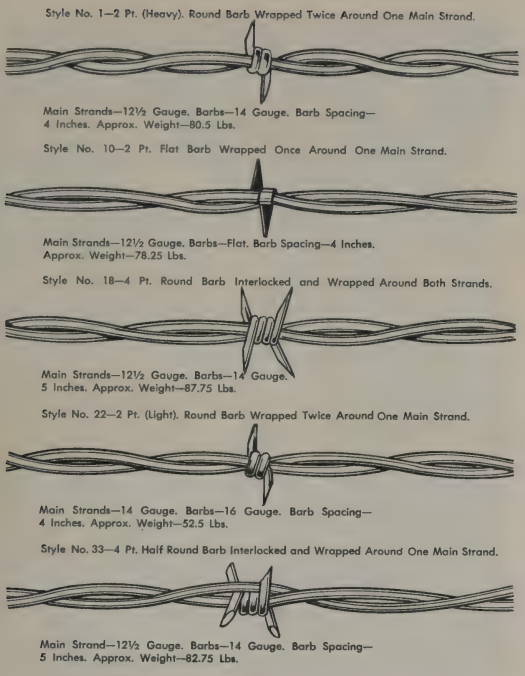
F.M. 2351, Kimble County. Pipe returned to original position.

The Barbed Wire Fence

Sometime during the Civil War the curtain was rung up on what might well be called the first act of the "drama of the plains." The setting was an orchard in the city of Austin owned by a German whose name history failed to record, but his ingenious idea of fashioning nails sharpened on each end between two smooth strands of twisted wire was to change the entire concept of farming and ranching. Like any other invention his barbed wire was created out of necessity, mainly to keep his neighbors cows out of his orchard. His new fence succeeded in two things. It kept the cows out of his orchard and brought the wrath of his neighbors upon him for resorting to such an inhuman device for curbing bovine appetites. At the beginning the barbed wire created violence as it would in years to come. Ironically, in the end, the first barbed wire fence undoubtedly ever built was torn down by its inventor for fear of mob violence.



Early specimens of barbed wire design.

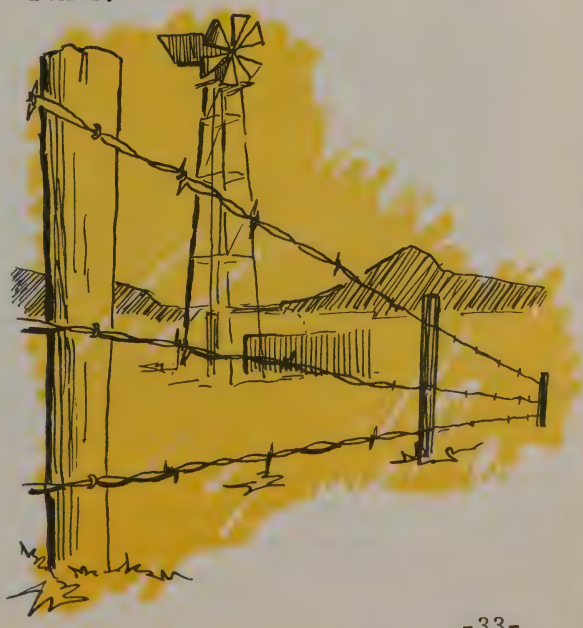

Style No. 1—2 Pt. (Heavy). Round Barb Wrapped Twice Around One Main Strand.
Main Strands—12½ Gauge. Barbs—14 Gauge. Barb Spacing—4 Inches. Approx. Weight—80.5 Lbs.
Style No. 10—2 Pt. Flat Barb Wrapped Once Around One Main Strand.
Main Strands—12½ Gauge. Barbs—Flat. Barb Spacing—4 Inches. Approx. Weight—78.25 Lbs.
Style No. 18—4 Pt. Round Barb Interlocked and Wrapped Around Both Strands.
Main Strands—12½ Gauge. Barbs—14 Gauge. 5 Inches. Approx. Weight—87.75 Lbs.
Style No. 22—2 Pt. (Light). Round Barb Wrapped Twice Around One Main Strand.
Main Strands—14 Gauge. Barbs—16 Gauge. Barb Spacing—4 Inches. Approx. Weight—52.5 Lbs.
Style No. 33—4 Pt. Half Round Barb Interlocked and Wrapped Around One Main Strand.
Main Strand—12½ Gauge. Barbs—14 Gauge. Barb Spacing—5 Inches. Approx. Weight—82.75 Lbs.

These are the different styles of barbed wire in use today.

In spite of its unpopularity, the barbed wire did manage to prick the public's mind and was eventually to find its rightful role. A manufacturer said recently upon refusing to sell barbed wire to certain Europeans that it was made only to keep "American cows where they belong." He could have added that it served America in both time of peace and war. World Wars I and II established its worth as a defense weapon when strung out in the path of the enemy. It plays an important role in the public roads of Texas. The Highway Department uses only an estimated 80 miles of barbed wire annually; however, the miles of it strung on each side of the some 200,000 miles of rural roads in Texas is astronomical.

On June 25, 1867, the first patent on barbed wire was issued to an Ohioan. A few years later in 1874, three additional patents were issued to three men who lived in De Kalb, Illinois. They immediately built a plant and began to manufacture barbed wire on a small scale, increasing the output gradually until it grew into a prosperous enterprise. The word spread and so did barbed wire. The founder of Amarillo, H. B. Sanborn, brought the first spool of commercially manufactured barbed wire into Texas and sold it in Gainsville in 1875. He later sold a carload in Austin, paving the way for the enterprising salesmanship of John W. Gates.

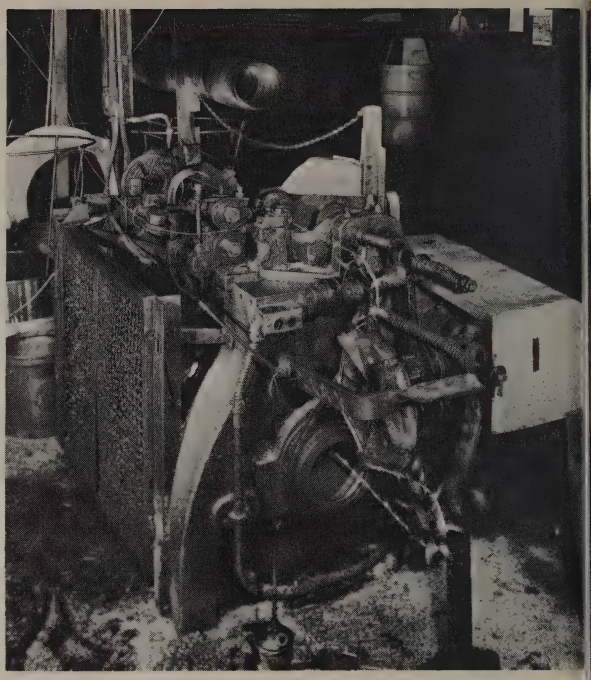
Gates, who made a fortune in selling barbed wire to Texas cattle kings, arrived in San Antonio, built a corral in the plaza, and drove 25 furious longhorn steers into the enclosure. The cattlemen observing this demonstration felt it was hardly worthwhile watching. With only three stands of small wire standing between a charging two-ton steer and his freedom it would hardly be any contest. They were wrong, and immediately realized that Gates had something after the steers had angrily charged the fence a few times and then retreated torn, bleeding, and subdued to a huddle in the middle of the pen. With this demonstration barbed wire had come to Texas.



There were many hardware dealers who refused to stock the new-fangled fence material on the grounds that it was cruel and barbaric. However, in spite of its ostracism, barbed wire spread across the plains like a prairie fire. Its strength, durability, and cheapness were the selling points upon which John Gates made his fortune and fenced in Texas. The manufacturers helped his cause by producing wire with more merciful barbs and shorter prongs.

Many law suits ensued over patent rights since numerous designs and types of barbed wire were placed on the market. In the beginning many states held the use of barbed wire illegal on the grounds that it was inhuman to cattle and dangerous to man. Most states required railroads to fence their rights of way, and by 1881 there were 93,671 miles of trackage all needing a three- or four-wire fence on each side. This greatly stimulated the sale and increased the popularity of the barbed wire fence. A stone, rail, picket, or board fence cost $300 and up per mile, while a three-strand barbed wire fence could be built for approximately $150 per mile.

Barbed wire fences did more in selling the prairie than any other single factor. It not only enabled the small farmer to gain and protect a foothold in the plains but also enabled the cattle man to secure and hold range lands for his herd. It afforded a scientific method of grazing by permitting the farmer-rancher to graze certain fields at the most opportune times. Livestock raisers became breed conscious and through the use of economically constructed barbed wire pens were able to greatly improve their stock through scientific breeding. The fences also made cattle thieving much more difficult, and cattle rustling was on its way out. The nomadic Indians could no longer roam the plains and were eventually to be literally fenced in on the reservations by barbed wire.

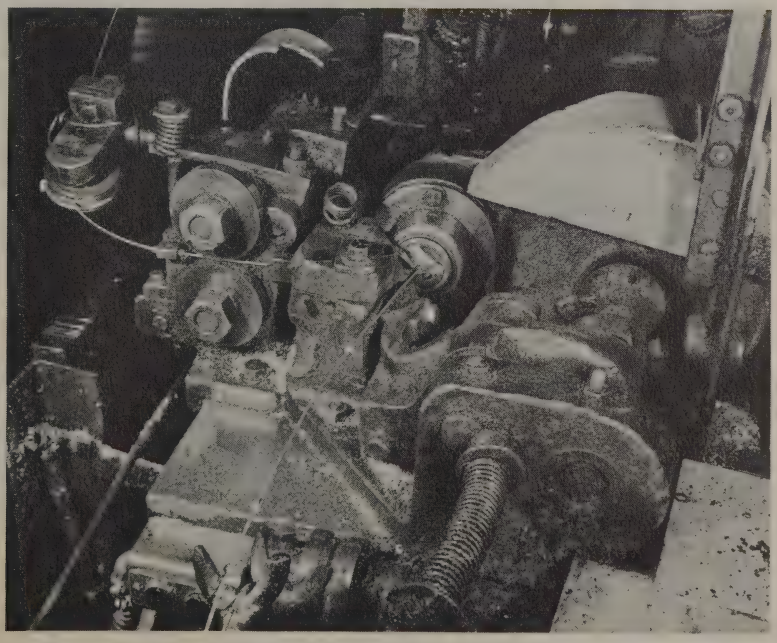


Three wires emerge from this automatic machine to form the barbed wire; one is cut to form the barb, and is attached to one wire. The third wire meets the wire with the barbs and the two are twisted as the reel revolves.

Barbed wire fences continued to grow and so did the number of settlers. With adequate fences it was no longer necessary for the ranchers to employ the small army of men needed for round-up, branding, trail driving, and other purposes. Thousands of cowboys were suddenly without work with the fencing of the range. These jobless cowpokes were left to drift and, in many instances, gave us our infamous outlaws of the past era.

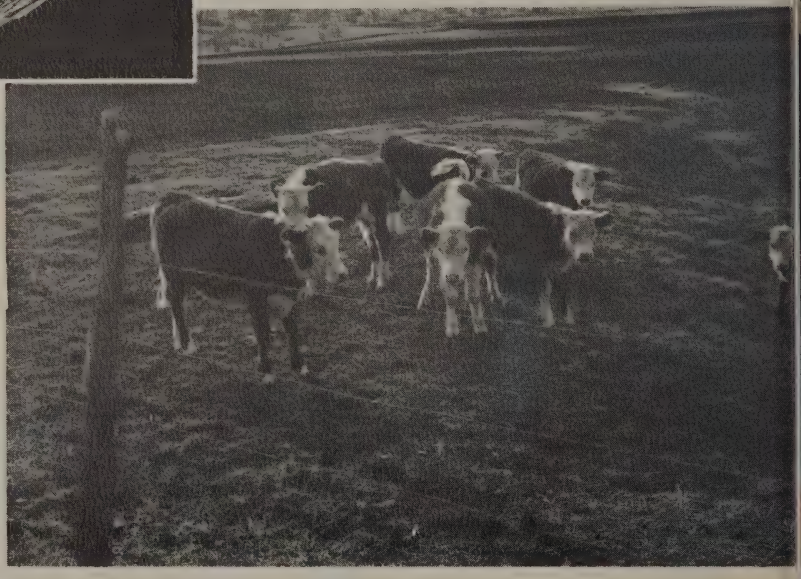
They had a bitter feeling toward that "blasted bobwire" that put them out of work. The rancher found his water holes and trails blocked by wire fences. During the heyday of the barbed wire fence, many parts of the west experienced an era of unprecedented violence and crime. The ranchers were marching into battle to the tune of "Don't Fence Me In," while the settlers rose to the music of "Home On The Range." The struggle between the free grazers and farmers to gain possession of the water holes and ranges became violent. Fences were strewn everywhere and a fence war ensued. In 1884, Governor Ireland called a special session of the Texas Legislature to pass laws to arrest the wire cutting epidemic. A law passed making fence cutting a felony. Article 1353, which is still in effect, set the penalty for wilfully cutting or damaging a fence at one to five years in the penitentiary. A land owner was justified in taking a pot shot at any fence slasher caught in the act. Fence cutting became unpopular and unhealthy.

The wire slashing declined under the strenuous laws and determined efforts of the land owners to protect their fences, and by 1885 the fences were being accepted. It was necessary to build public roads throughout the lands. Man could no longer travel across country at will but was compelled to follow the public road to his destination. The influence of the barbed wire fence undoubtedly speeded



Here, the barb is being attached to one of the line wires. An interesting feature, not shown in the picture, is the action of the reel which rotates on two axes, twisting the wires and reeling the wire on the cone at the same time.

This finished roll of barbed wire will in all probability fence in range land somewhere in Texas.



The barbed wire fencing in this range land doesn't seem to bother these grazing Whiteface.

up the necessity and demand for a connecting system of public roads.

By 1888 the final curtain had been rung down on the giant cattle ranges with bristling barbs. As the El Paso Tribune put it, "When one has to lease land in Texas, buy water fronts... and build fences, his fate is sealed." The powerful and colorful Cattle Barons who had dominated the open range were being recorded in history. Replacing them were the small, unglamorous combination stockmen-farmers whose property boundaries were measured by barbed wire fences rather than how far the eye could see. The stock farmers with their better breed of cattle, better and closer management, better grasses, and smaller herds had come to stay. The barbed wire fence had made this transition possible. It truly made the stock farmer, and made it possible for him to build a new kind of home on the range.

HIGHWAY IN THE NEWS

Ribbon Ritual Opens New Highway Lane

A car of Wisconsin-bound tourists paused long enough at 9 a.m. today to snip a ribbon that diverted a heavy stream of traffic and officially put more than two and one-quarter million dollars worth of Denison highway improvements into service.

Protesting that "I'm not dressed for the occasion, "Mrs. O. N. Bonde, wife of an Army captain, was drafted for the ribbon-cutting ceremony that marked the opening of the new Highway 75 route through Denison.

A small group of Chamber of Commerce representatives, city officials, and others clustered at the barricade just north of Iron Ore Creek where the brief ritual took place.

State Highway Patrolmen W. J. Morris and Richard Wacaser helped flag down a tourist car about a minute before the ceremony was to start.

In the car were Capt. and Mrs. Bonde and two of their three children, Christopher, 2, and who was wide-eyed about all the excitement, and Yvonne, 10.

A bit apprehensive about being flagged down by patrolmen, the Bondes breathed a bit easier when told what it was all about that is until Mrs. Bonde, dressed for comfortable traveling, learned she was to pose for a Denison Herald picture cutting the ribbon.

Invocation by Rev. James Logan, First Presbyterian minister, opened the ceremony arranged by Jerome McKinney, C. of C. highway committee chairman. L. M. Newsom spoke briefly, presenting Mayor Harry Glidden, who made a few remarks and handed the scissors to Mrs. Bonde.

RIBBON SNIPPED—Mrs. O. N. Bonde of Wisconsin who was in the first car through helps Mayor Harry Glidden snip the official ribbon. The Bonde auto started a steady parade of cars and trucks into Denison on the new route.

A quick snip opened the highway, with the Bonde car first at the barrier to head the procession across town. They were en route to Wausau, Wis., where Capt. Bonde will be stationed after just returning from Korea. His family had joined him at San Antonio and they spent last night at Dallas.

Mrs. Bonde was a bit breathless about it all "The next time I come to Texas I'll be dressed for unexpected ceremonies," she laughed as their car, with Capt. Bonde at the wheel. headed for Denison on the broad, double-laned throughfare.

TEXAS ROAD MILEAGE SUMMARY

As of January 1, 1957

Mileage of State and County Roads 199,708

STATE HIGHWAYS

- FA---- 15,879.98
- FAS--- 9,741.22 - (Of this 899 Mi. are new hwys. since Sept., 1945)
- NonFA- 761.58
- Total- 26,382.78

Designated but not yet under maintenance 417.90

Marked & Maintained 25,964.88

- *Urban-City Maint. Paved: 129.77
- *Urban-State Maint. Paved: 2,342.44
- Rural-State Maint. 23,492.67

- Earth 94.63
- **Metal Surface 17.88
- Paved 23,380.16

FARM TO MARKET ROADS

- FAS--- 18,049.29
- NonFA- 11,096.12
- Total- 29,145.41

Designated but not yet under maintenance 3,315.36

Marked & Maintained 25,830.05

- *Urban-City Maint. Paved: 22.87
- *Urban-State Maint. Paved: 619.58
- Rural-State Maint. 25,187.60

- Earth 11.20
- **Metal Surface 10.10
- Paved 25,166.30

TOTAL HIGHWAY SYSTEM

- FA---- 15,879.98
- FAS--- 27,790.51
- NonFA- 11,857.70
- Total- 55,528.19

Designated but not yet under maintenance 3,733.26

Marked & Maintained 51,794.93

- *Urban-City Maint. Paved: 152.64
- *Urban-State Maint. Paved: 2,962.02
- Rural-State Maint. 48,680.27

- Earth 105.83
- **Metal Surface 27.98
- Paved 48,546.46

Dustless road mileage in State:

County System ...	10,392
State System ...	51,661
Total	62,053

Total street mileage in all Texas incorporated cities 30,907

* Urban refers to mileage within incorporated cities.
** Metal includes gravel, caliche, shell, etc.

. . . We disliked the beer cans and litter on highways, but it is no worse in Texas than other states. . .

R. H. Boehmler
Hampton, Iowa

* * *

Having recently returned from an 8,000-mile trip through eleven states we just want to tell you what a joy it was to find the many beautiful and clean roadside parks in Texas.

In all our travels we have found no long stretch of highway more beautiful than your 190, say from Huntsville to the Louisiana line, that long avenue of pines. We think it should be advertised from coast to coast that more tourists might know about it and come to enjoy it.

Herman Moritz
DeRidder, Louisiana

* * *

We had always heard of the friendliness and hospitality of the Texans. This fall on our vacation we had a wonderful example of this. Just three miles south of Hillsboro we had a flat tire. It was very hot and our jack wouldn't work right. Within minutes a car drove up and stopped with us. One of your wonderful Texans and a member of your highway department not only loaned us his jack but changed our tire for us. All through your state we noticed this big hearted friendliness. Also we think your highways are the most beautiful we have toured anywhere in the U. S. A. and we have driven in all 48 of our states.

Mr. and Mrs. M. J. Caponi
Mason City, Iowa

(Ed. Note: The man who helped Mr. and Mrs. Caponi was J. V. Hasley, Senior Maintenance Foreman, Hillsboro, Texas.)

. . . I recently received a letter advising me that I could secure my amateur radio operator's license plates from the local tax assessor after February 1, 1957.

It was very splendid of your office to go to this trouble of advising me of this, however, I was not unduly surprised, because over the years I have come to have the very greatest admiration and respect for the wonderful service that the Texas Highway Department has rendered to citizens of Texas, not least of which is the excellent and cordial treatment of your own division. (Motor Vehicle)

I can think of no other state that has better highways, and it is very seldom outside of the state of Texas that one encounters well kept and strategically located roadside parks, as well as adequate parking shoulders and other benefits too numerous to mention. . .

W. H. Cowan
Austin, Texas

★ ★ ★

. . . A yellow state gravel truck passed me, and gravel came off the truck (passing in the other direction), smashed my windshield, and caused it to be cracked from top to bottom right in front of driver's vision. He must have been overloaded and driving too fast. . .

R. F. Arnold
Dallas, Texas

★ ★ ★

My husband and I have just returned from a vacation trip covering quite a bit of Texas highways, and we just wanted to express our appreciation for the modern highways and roadside parks which we found all over Texas.

We sincerely hope that Texas will set an example to its neighboring states so that they will improve their highways. We were so pleased to find such smooth well-kept highways in Texas, even on the lesser traveled roads. Now that we know where our tax money is going, we don't mind a bit!

Mrs. C. D. Kelly
Houston, Texas

★ ★ ★

. . . You need billboards outside the big cities to show bypass system. You have an excellent program on your highway system, one of the best in comparison to other states. . .

Minneapolis, Minnesota

"Its a Mr. J. Wetwood Flinglebarough... he wants an application blank and a list of the legal holidays!"